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Case Report
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Testicular Metastasis in Carcinoma Prostate: Beyond the Expected

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Abstract

A 60-year-old man without comorbidities presented with lower urinary tract symptoms. Initial investigation revealed elevated Prostate Specific Antigen (PSA) levels and MRI findings consistent with high-risk prostate cancer. He underwent Neo Adjuvant Hormonal Therapy (NAHT) and External Beam Radiotherapy (EBRT), achieving initial PSA suppression. Post-therapy, PSA levels rose, prompting further evaluation. PSMA PET CT revealed metastasis to the right testis. Bilateral orchidectomy confirmed metastatic carcinoma consistent with prostatic adenocarcinoma in the right testis. Subsequent PSA and testosterone levels decreased post-orchidectomy. Despite declining CYP17A1 inhibitor Abiraterone, he remained in biochemical and radiological remission as of November 2023. This case underscores the importance of vigilant monitoring and tailored treatment strategies for metastatic prostate cancer, particularly in unusual sites like the testis.

Keywords: Testicular Metastasis; Unusual Metastasis; Oligometastasis; Testicular metastasis; Orchidectomy

Abbreviations: PSA: Prostate Specific Antigen; NAHT: Neo Adjuvant Hormonal Therapy; EBRT: External Beam Radiotherapy; RT: Radiotherapy; BCR: Biochemical Recurrence; RP: Post-Radical Prostatectomy; TM: Testicular metastasis; GS: Gleason Score; ADT: Androgen Deprivation Therapy

Introduction

Prostate cancer presents a significant global health challenge, with India alone detecting approximately 28,000 new cases annually, showcasing a concerning trend of increasing incidence rates over time. Prostate cancer management centers on risk stratification tailored to patient life expectancy, with metastasis status at diagnosis being a key determinant of prognosis.

Case Report

A 60-year-old gentleman was evaluated for complaints of Lower urinary tract symptoms On investigative work up his Prostate Specific Antigen (iPSA) was to be elevated to 14.9 ng. Magnetic Resonance Imaging of the pelvis was suggestive of a T2 signal intensity mass lesion with restricted diffusion and early enhancement in the left peripheral zone and adjacent portion of the central gland at apex & extending into medial portions of seminal vesicles. PSMA PET CT scan showed an enlarged prostate measuring 5.1 x 4.1 x 3.8 cm with heterogeneous increased uptake predominantly on left side - ? mitotic associated with loss of fat plane with anterior wall of rectum. Trans Rectal Ultrasound guided biopsy from the prostatic lesion was suggestive of Adenocarcinoma, acinar, Gleason Score (GS) of 5 + 3 = 8 and presence of perineural invasion . He was ascribed high risk category and was planned for Neo Adjuvant Hormonal Therapy with Luteinizing Hormone Releasing Hormone analog followed by External Beam Radiotherapy along with androgen deprivation therapy (ADT) followed by adjuvant Hormonal therapy . He was started with LHRH analogue and PSA measured 6 weeks later was 0.0368. He was then planned for EBRT to a dose of 68Gy/25 fractions/5 weeks @ 2.7Gy/fraction to Planning Tumor Volume via Intensity Modulated Radiotherapy + Volumetric Arc Therapy . He completed treatment on 16-11-2017 and then was on a regular follow up. 3 months post radiotherapy at his first follow up visit, PSA = 0.031. He continued ADT and annual prophylactic

bisphosphonate therapy based on raised T scores on Dexa Scan till 01-06-2019 .On completion of 18 months of ADT his PSA level was 0.079 and testosterone level were castrate-11.69.

Two months after ADT withdrawal, 2 successive PSA samples done in August 2019 & September 2019 were 0.354 & 0.748, respectively. PSMA PET CT scan revealed no evidence of disease. There was serial increase in the monthly PSA further on and the last measurement done in August 2020 was 8.01 & Serum testosterone was 60.3. PSMA PET CT scan done in August 2020 suggested of mild inhomogeneous PSMA uptake in prostate gland, an ill-defined heterogeneously enhancing lesion is seen in the right testis - suspicious for metastases. He underwent simple orchidectomy on 28-09-2020. Histopathology report confirmed features of metastatic carcinoma consistent with prostatic acinar adenocarcinoma in right testis . Post orchidectomy his serum PSA and Testosterone levels declined. After a multimodality tumour board discussion, he was advised CYP17A1 inhibitor Abiraterone which the patient declined and is kept under close follow up and is in biochemical and radiological remission till last follow up in Nov 2023.

Illustration 1- Timeline of events

(Figure 1).

Figure 1.

Discussion

While multimodal therapies have improved overall outcomes, biochemical recurrence (BCR) remains a common occurrence, affecting 20-40% of post-radical prostatectomy (RP) and 30-50% of post-radiotherapy (RT) patients within a decade.

BCR, though asymptomatic, signifies a recurrence and prompts further evaluation. Establishing the site of recurrence can be challenging, as evidenced by cases where diagnostic imaging such as PSMA PET fails to reveal locoregional or distant lesions. In one instance, BCR preceded clinical recurrence by a year, with PSMA PET scan initially yielding negative results until a testicular lesion emerged as PSA levels reached 8 ng. In a prospective multicenter study in PCa patients with biochemical recurrence (BCR) the diagnostic capacity of fluciclovine PET/CT for recurrence was found to be proportional to prescan PSA values .This study appreciated detection rate of 31% in patients with PSA levels between 0 & 0.5 ng/mL & 79% in patients with PSA more than 1.0 ng/ml [1]. This highlights the complexity in managing BCR, especially when no clinical disease is apparent, underscoring the importance of balancing treatment benefits with potential adverse effects on quality of life.

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Testicular metastasis (TM) is rare, occurring in only about 0.5% of cases [2]. Many hypotheses have been proposed such as direct seedling through lumen of vas deferens or by arterial/venous/lymphatic retrograde spread. Few authors suggest solitary testicular metastasis from prostate cancer could be facilitated by the unique lymphatic anatomic connections between the prostate and testicle This rarity is attributed to factors such as the blood-testis barrier and lower scrotal temperatures inhibiting tumor cell proliferation [3].

The diagnostic and therapeutic significance of TM is underscored by its association with poor prognosis and aggressive disease progression, as evidenced by studies correlating TM with adverse outcomes in advanced prostate cancer [4]. Orchidectomy, the surgical removal of the affected testicle, remains the mainstay treatment for TM, offering immediate cytoreduction. While second-line therapies are not firmly established, CYP17A1 inhibitors may be considered in castration-resistant cases. However, patient acceptance of such treatments varies.

Some reports suggest that isolated post-prostatectomy testicular metastasis have shown long progression free survival after orchidectomy. In patients with testicular metastasis of PCa, survival after diagnosis is usually <1 year. Lu et al. [5] found that the mean survival period after orchiectomy was 12.8 months in patients with PCa and 7.4 months in those with other forms of cancer. Post-orchiectomy, monitoring for recurrence or progression is crucial, with some reports suggesting prolonged progression-free survival post-surgery. Despite the lack of extensive literature on the prognostic significance of isolated testicular recurrence, survival post-diagnosis is generally short, emphasizing the need for vigilant follow-up and potential adjuvant therapies.

In conclusion, while isolated testicular metastasis is rare, it should be considered in cases of unexplained PSA elevation post-androgen deprivation therapy withdrawal. Orchidectomy serves as a pivotal intervention, aiding in both diagnosis and treatment, thereby improving progression-free survival. Close monitoring and consideration of adjuvant therapies are essential for managing recurrent or progressive disease effectively, thereby enhancing patient outcomes and quality of life.

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